environmental
properties management, LLC

April 10, 2018

Mr. Ken Kalman
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Mr. Paul Davis
Oklahoma Department of Environmental Quality
707 North Robinson
Oklahoma City, OK 73101

Mr. Robert Evans
U.S. Nuclear Regulatory Commission
1600 East Lamar Blvd; Suite 400
Arlington, TX 76011-4511

Re: Docket No. 70-925; License No. SNM-928
Environmental Sequence Stratigraphy (ESS) and Porosity Analysis, Burial Area 1

Dear Sirs:

Groundwater in the transition zone material in Burial Area #1 (BA1) yields the highest uranium concentrations anywhere on site. It has long been understood that the transition zone contains a large percentage of interbedded fine-grained material which has a low hydraulic conductivity. Zones of higher-permeability material did not appear to form continuous layer(s) through transition zone material. The heterogeneity of this material creates significant uncertainty in several aspects of groundwater assessment and remediation planning, including:

- The distribution of higher uranium concentrations between lower- and higher-permeability soils
- The continuity of higher-permeability lenses or zones
- The estimation of groundwater extraction rates and the extent of the range of influence of groundwater extraction on the transition zone
- The estimate of the affected pore volume

The 2017 pilot test yielded two pieces of somewhat conflicting information:

1. The groundwater extraction trench (GETR-BA1-01) installed in BA1 transition zone material could not sustain 50 percent of the groundwater production that had been previously estimated for this material indicating *hydraulic isolation*.
2. The injection of potable water into the groundwater injection trench installed in Sandstone B of BA1 (GWI-BA1-01) showed an influence that extended all the way to the groundwater extraction trench (GETR-BA1-01), much farther than anticipated, and indicating *hydraulic connectivity*.

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Based on the pilot study data, it appeared that there may be more interconnection within higher permeability material in the transition zone than previously thought, because the influence of injection extended further than expected. But it also appeared that low-permeability material may essentially surround the higher-permeability zones, minimizing the potential for connection of the BA1 area to the surrounding aquifer and thus sustainable yield of the extraction trench.

Within the past few years, several tools have been developed which enable Burns & McDonnell remediation personnel to enhance the definition and depiction of subsurface material. Burns & McDonnell has developed a process called Environmental Sequence Stratigraphy to provide insight into the depositional environment in which surface and subsurface materials were deposited (laid down), which ultimately provides a more detailed conceptual model and knowledge of factors which control groundwater flow and contaminant migration. The decision was therefore made to utilize this process and these tools to obtain improved definition of the subsurface material in BA1, enabling us to optimize the groundwater remediation design.

The results of this evaluation are presented in the attached technical memorandum. As a result of both the evaluation of Pilot Test data and the processes employed in performing this evaluation, it is believed that the uncertainties associated with groundwater remediation planning and with estimating the duration of remediation (and associated cost of decommissioning) are greatly reduced.

The attached technical memorandum presents the data evaluation that was performed, three-dimensional illustrations of the subsurface soil in the transition zone, and a calculation of the pore volume upon which the duration of remediation will be calculated. The results will be incorporated into *Facility Decommissioning Plan – Rev 1*.

The content and plans for remediation in this area will represent yet another a significant aspect of our May 16 – 17, 2018 meetings. If you have questions or comments about the enclosed report, please contact me at 405-642-5152 or at jlux@envpm.com.

Sincerely,

Jeff Lux, P.E.
Project Manager

Enclosure